

CLAIMS:

1. An ultrasonic pulse transmission method comprising:
when a number of packets P (≥ 2) is defined for conducting P ultrasonic
5 pulse transmissions in one direction to acquire one acoustic line signal,
interleaving at least one ultrasonic pulse transmission for acquiring an acoustic
line signal that belongs to a frame different from that to which said former
acoustic line signal belongs between the ultrasonic pulse transmissions in said
one direction.
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2. The ultrasonic pulse transmission method of claim 1, further
comprising: when a number of interleaves I (≥ 2) is defined, interleaving
ultrasonic pulse transmissions for acquiring $(I - 1)$ acoustic line signals that
belong to $(I - 1)$ frames different from the frame to which said former acoustic
15 line signal belongs between the ultrasonic pulse transmissions in said one
direction.
3. The ultrasonic pulse transmission method of claim 1, further
comprising: electronically changing the ultrasonic pulse transmission direction
20 among acoustic line signals that belong to the same frame, and also electronically
changing the ultrasonic pulse transmission direction among acoustic line signals
that belong to different frames.
4. The ultrasonic pulse transmission method of claim 1, further
25 comprising: electronically changing the ultrasonic pulse transmission direction
among acoustic line signals that belong to the same frame, and mechanically
changing the ultrasonic pulse transmission direction among acoustic line signals
that belong to different frames.
- 30 5. The ultrasonic pulse transmission method of claim 1, further

comprising: conducting ultrasonic pulse transmissions simultaneously in different directions to simultaneously acquire a plurality of acoustic line signals.

6. The ultrasonic pulse transmission method of claim 1, further
5 comprising: acquiring acoustic line signals containing flow information.

7. An ultrasonic diagnostic apparatus comprising:
an ultrasonic probe;
a number-of-frames defining device for defining a number of frames f ;
10 a number-of-packets defining device for defining a number of packets P (≥ 2);
a transmitting/receiving device for driving said ultrasonic probe to conduct P ultrasonic pulse transmissions in one direction and receive echoes to acquire an acoustic line signal; and
15 a transmission direction control device for controlling the transmission direction to interleave at least one ultrasonic pulse transmission for acquiring an acoustic line signal that belongs to a frame different from that to which said former acoustic line signal belongs between the ultrasonic pulse transmissions in said one direction.

20 8. The ultrasonic diagnostic apparatus of claim 7, wherein said apparatus comprises a number-of-interleaves defining device for defining a number of interleaves I (≥ 2), and said transmission direction control device controls the transmission direction to interleave ultrasonic pulse transmissions
25 for acquiring $(I - 1)$ acoustic line signals that belong to $(I - 1)$ frames different from the frame to which said former acoustic line signal belongs between the ultrasonic pulse transmissions in said one direction.

9. An ultrasonic diagnostic apparatus comprising:
30 an ultrasonic probe;

a number-of-frames defining device for defining a number of frames f ;

a number-of-packets defining device for defining a number of packets P (≥ 2);

5 a transmitting/receiving device for driving said ultrasonic probe to conduct P ultrasonic pulse transmissions in one direction and receive echoes to acquire an acoustic line signal;

a transmission direction control device for controlling the transmission direction in an intra-frame mode in which the transmission direction is controlled to interleave at least one ultrasonic pulse transmission for acquiring another
10 acoustic line signal that belongs to the frame to which said former acoustic line signal belongs between the ultrasonic pulse transmissions in said one direction, or in an inter-frame mode in which the transmission direction is controlled to interleave at least one ultrasonic pulse transmission for acquiring an acoustic line signal that belongs to a frame different from that to which said former acoustic
15 line signal belongs between the ultrasonic pulse transmissions in said one direction; and

an interleave mode selecting device for an operator to select between said intra-frame mode and inter-frame mode.

20 10. The ultrasonic diagnostic apparatus of claim 9, wherein said apparatus comprises a number-of-interleaves defining device for defining a number of interleaves I (≥ 2), and said transmission direction control device controls the transmission direction to interleave ultrasonic pulse transmissions for acquiring $(I - 1)$ other acoustic line signals that belong to the frame to which
25 said former acoustic line signal belongs between the ultrasonic pulse transmissions in said one direction, or to interleave ultrasonic pulse transmissions for acquiring $(I - 1)$ acoustic line signals that belong to $(I - 1)$ frames different from the frame to which said former acoustic line signal belongs between the ultrasonic pulse transmissions in said one direction.

11. The ultrasonic diagnostic apparatus of claim 7 or claim 9, wherein said ultrasonic probe is a two-dimensional array ultrasonic probe, and said transmission direction control device electronically changes the ultrasonic pulse transmission direction among acoustic line signals that belong to the same frame, and also electronically changes the ultrasonic pulse transmission direction among acoustic line signals that belong to different frames.

12. The ultrasonic diagnostic apparatus of claim 7 or claim 9, wherein said apparatus comprises a mechanism that can mechanically change orientation of said ultrasonic probe in a direction orthogonal to a frame, and said transmission direction control device electronically changes the ultrasonic pulse transmission direction among acoustic line signals that belong to the same frame, and mechanically changes the ultrasonic pulse transmission direction among acoustic line signals that belong to different frames.

13. The ultrasonic diagnostic apparatus of claim 7 or claim 9, wherein said transmitting/receiving device conducts ultrasonic pulse transmissions simultaneously in different directions to simultaneously acquire a plurality of acoustic line signals.

14. The ultrasonic diagnostic apparatus of claim 7 or claim 9, wherein said transmitting/receiving device acquires acoustic line signals containing flow information.